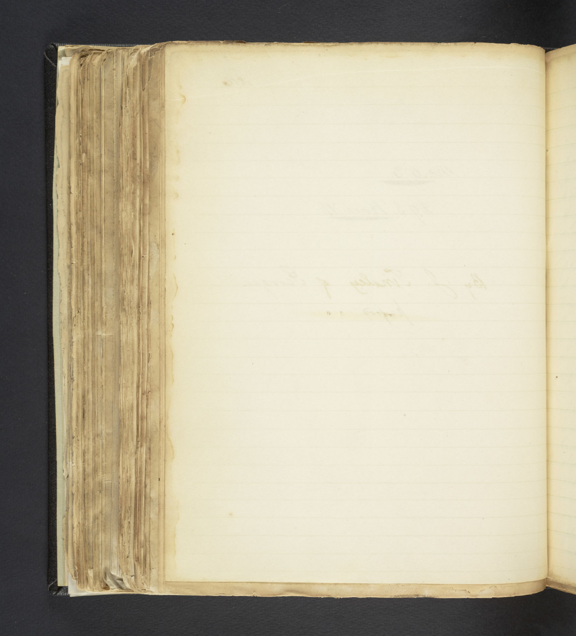
1816 #10

Diabetes

No. 53.

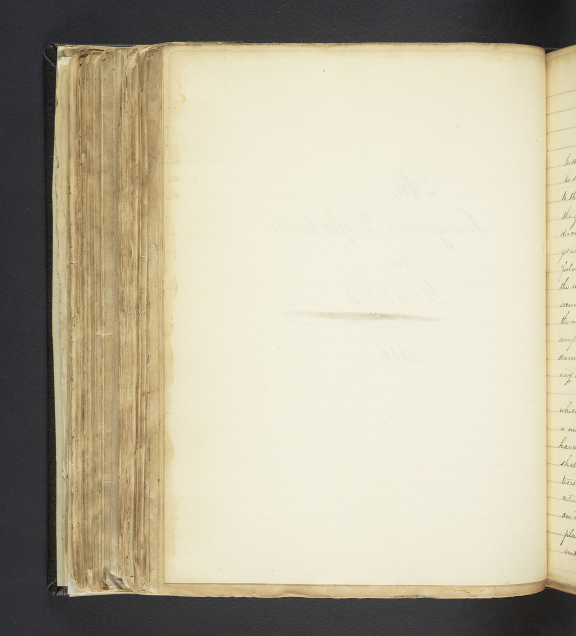
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By J. Tinsley of Georgia
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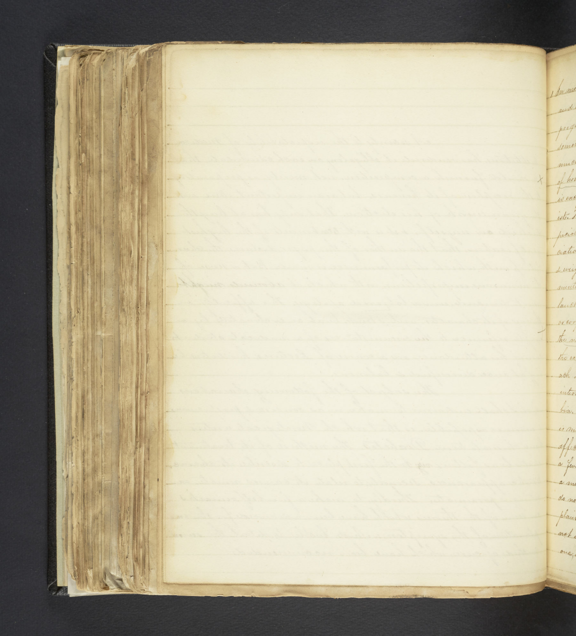
An
Inaugural Dissertation
on
Diabetes.

1816

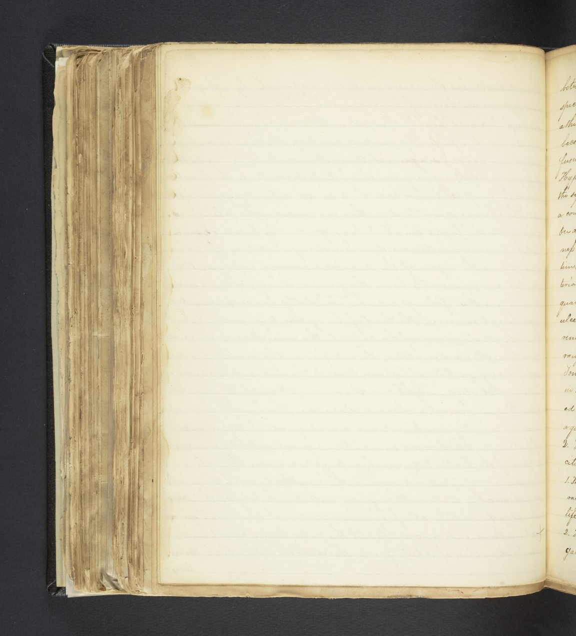


A security to the respectability of Medical Institutions, has rendered it obligatory on each candidate, that he should furnish a composition, not merely as preparatory to the reception of its honours, but, as an important item in the groundwork of his election. That duty has at length devolved on myself, & it is with sentiments of the highest gratification, that the author of this paper declares the cheerfulness with which its performance is made. But a sense of the numerous imperfections, with which it abounds might seem to demand, even a laboured apology. This difficulty in the way of its character, will, I trust, be at once obviated, by a simple reference to the circumstances of a medical student, during his attendance on a course of Lectures; his duties being at once diversified & laborious.

The subject of the following observations which I shall endeavour to make in as concise & perspicuous a manner as possible, is that which Nosological writers have chosen to term, Diabetes. The method of its treatment shall be as follows viz: In the first place to describe its characteristic appearances. secondly, to relate its causes remote, exciting & proximate. Thirdly, to make a few brief remarks on some of the theories which have been advanced for the explanation of the symptoms. And, lastly, to detail the several methods of cure, which have been recommended.



In most instances the disease makes its approach by a frequent and copious discharge of limpid urine, which in its farther progress becomes highly charged with a saccharine principle. sometimes it is perfectly insipid & watery; at others, it contains much mucilage; & again, at times its consistence is nearly that of honey, partaking very much of its taste & colour. The thirst is excessive, appetite voracious, & much costiveness generally exists. The skin is generally dry, there is a considerable debility, especially in the legs, & the whole body gradually becomes emaciated. In many instances there is a strong sensation of pain & weight in the region of the kidnies, & urinary passages, the mental energy seems to be on the decline, the reflections are melancholy, & the feelings & desires of the patient are totally averse to mental or corporeal exercise. The heat of the system is generally below the natural standard of the patient, the muscles are flaccid the extremities oedematous; there is frequently much head-ach, many gastric affections; toward the end a diarrhea, interrupted sleep, night sweats, & symptoms of hydrophobia. It is in general a chronic disease. Those with which it is most usually combined, are several species of pulmonic affection, in which cases, emaciation & great debility ensue, & a fever of the hectic type makes its appearance though in a manner calculated to deceive the inattentive, or those who do not make a minute inquiry into the history of the complaint. An indistinctness of vision & a troublesome vertigo are not unfrequent concomitants; the pulse being at all times one, indicative of debility. Another disease with which Diabetes



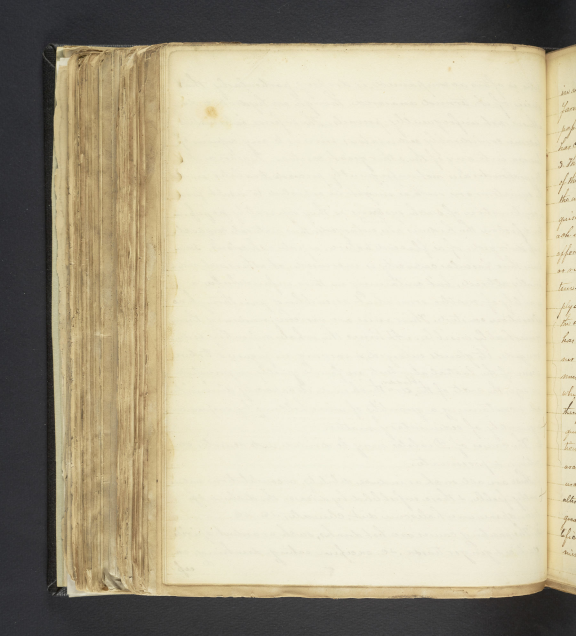
betes is often accompanied, is dropsy, particularly that species of it termed anasarca, though an hydropic diathesis not unfrequently prevails. The inferior extremities become considerably oedematous previous to any copious effusion into any of the other great cavities. Hysteria & Hypochondriasis not unfrequently precede Diabetes, in wh. the symptoms are such as might be expected to result from a combination of such systems as they separately possess. — On dissection the kidnies are found enlarged, their natural compactness destroyed, of a flaccid texture, a pale ash colour, sometimes their vascular capacity is increased; at others not materially altered, but containing in their infundibula a quantity of matter somewhat resembling pus, though no ulceration existed. Their veins are varicose, rendering them remarkably visible. At times the whole mesentery is deranged, its glands enlarged, & varying in figure & texture. Some of the lacteal absorbents are found greatly augmented in size, the coats of the bladder are thickened, its capacity diminished & containing a quantity of urine holding by suspension a quantity of sedimentary matter.

2. The causes of Diabetes may be divided into remote, exciting, & proximate.

1. These are all such as induce debility, as constitutions naturally feeble, & those enfeebled by disease, the decline of life, spare, unwholesome diet, climate, &c. &c.

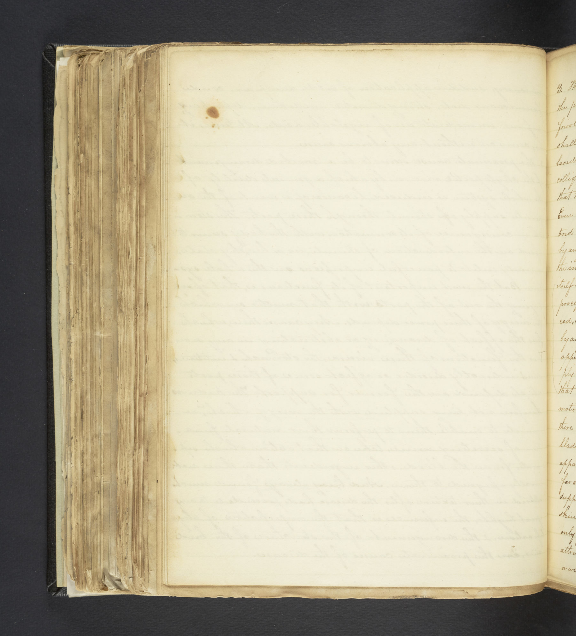
2. The exciting causes are hot drinks, such as ardent spirits garlic & ginger teas, &c. excessive eating, drinking, ex-

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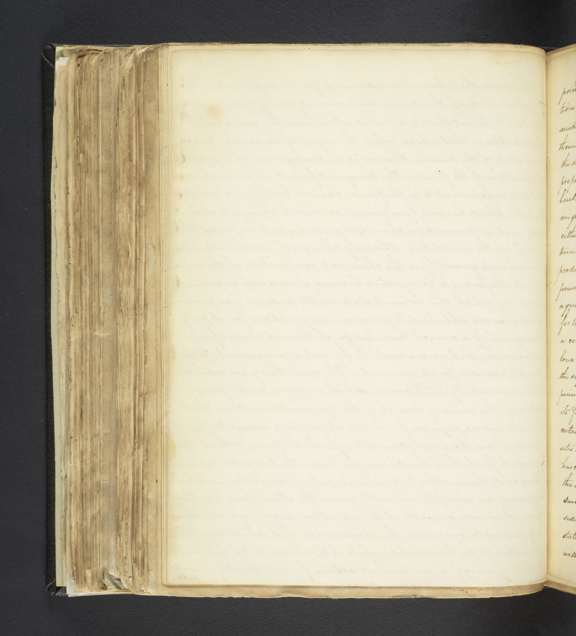


in venery, sudden application of cold. damp air, crude farinaceous diet. strong diuretic medicines. depressing passions. immoderate use of vegetable acids. At times it has come on without any obvious cause.

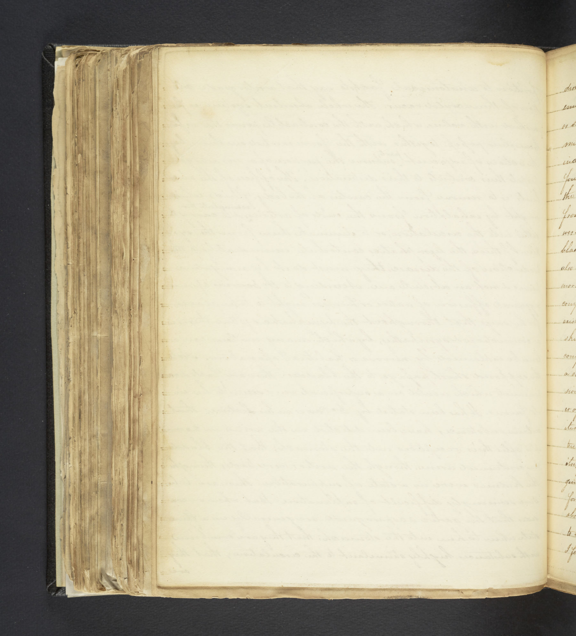
3. The proximate cause seems to be a morbid derangement of the chylopoetic viscera, by which a general debility of the whole system is induced, because of a want of the requisite supply of stimuli through those parts. The stomach in consequence of its connection with the body seems to afford on the introduction of stimuli, in a healthy state, a ready inlet to powerful impressions on the whole system. But the most important of its functions is, that of supplying the rest of the parts with that matter on which the energy of their power depends. Any cause then, which has the effect of deranging or obstructing in any manner the functions of these viscera, the stomach & intestines, must indirectly disorder or affect some of those parts which depend on the former for support. The kidneys therefore not being supplied with the energy which is requisite to enable them to perform their natural function of secreting urine, take on that action which separates from the blood, other ingredients than those naturally assigned to them. And being always found much altered in their texture after the disease had proceeded to any great hight, the inference is that the imperfection of chylification, & the derangement of the structure of the kidnies, are the proximate causes of the disease.



3. The theories that have been advanced for the explanation of the phenomena of this disease are various, & many of them too frivolous to be entitled to a consideration here. The first which I shall notice is that which refers the origin of the disease to a relaxed state of the kidnies themselves, in consequence of a general colliquation of the fluids. This theory is deficient in as much as that this dissolved state of the fluids has not been found to exist. Even the blood has not been found so much changed or altered in its appearance, or chemical properties as to be perceptible by any of the usual tests. The only changes of importance are the increased quantity & the chemical composition of the urine itself. It therefore is to be rejected because it does not explain the process by which this relaxed state of the kidnies was produced, & thus might lead to an erronious practice: for it is only by acquiring a correct knowledge of the real cause of an appearance, that we are enabled, by rule & judgement, to apply the remedy for its removal. The next theory in order is that advanced by Dr. Darwin, which supposes a retrograde motion of the urinary branch of the lymphatic system, that there is a nearer passage from the alimentary canal to the bladder, than the circulation through the kidnies, & that the apparent fact, that the discharges from the body do at times far exceed the matter taken in, is only to be explained by supposing an absorption of water from the atmosphere by the skin. A remark on each of these positions may suffice. The only principle on which the phenomena of Diabetes can be attributed to the lymphatic vessels, is to suppose a loss of tone, a want of energy, a diminished action, for it is directly in opposition

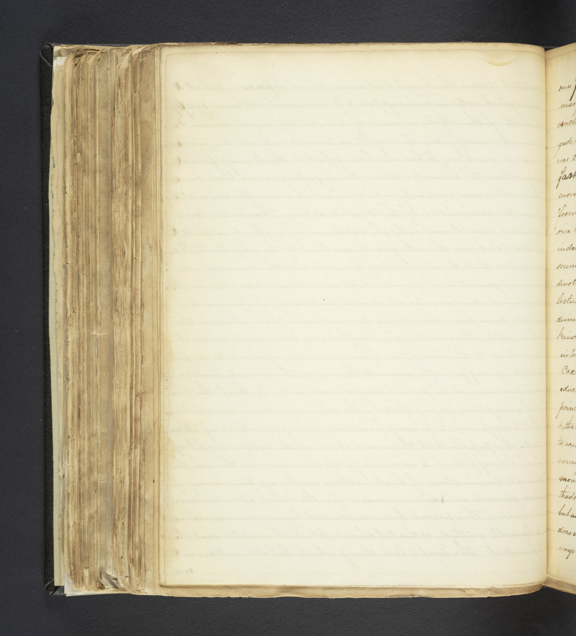


position to anatomical fact to say that a retrograde motion of these could occur. The whole absorbent system is furnished with valves, which, with the contractile power the vessels themselves possess, together with the force exerted on them by the action of adjacent parts, subserve the purpose of a vis a tergo to propel their contents to their destination. The office of the absorbents is to remove from the cavities of the body, fluids which might by exhalation from the ends of arteries, accumulate there, & to carry them either into the circulation, or to eliminate them from the system. If then, the lymphatics contribute immediately to the production of the disease, they must do it by a negative power & not an absolute one. According to Dr. Darwin's opinion a general effusion of waters or humors ought to take place, for he says that throughout the lymphatic system there is a connection & sympathy, by which many motions can alone be explained by nervous, or habitual association. As to the supposed short passage to the bladder, there are facts & experiments which would on a superficial view seem to be in its favour. It has been stated by Dr. Coxe in his Lectures that certain substances have been detected in the urine, in 20 minutes after their reception into the stomach; that the bladder has contained urine, though the ureters were tied, though the kidneys were in a state of suppuration. These are to be sure seemingly difficult of explanation. But when we consider that the garlic & asparagus &c. are generally in a fluid state when taken into the stomach; that they are combined with substances highly stimulant to the circulation; that they are



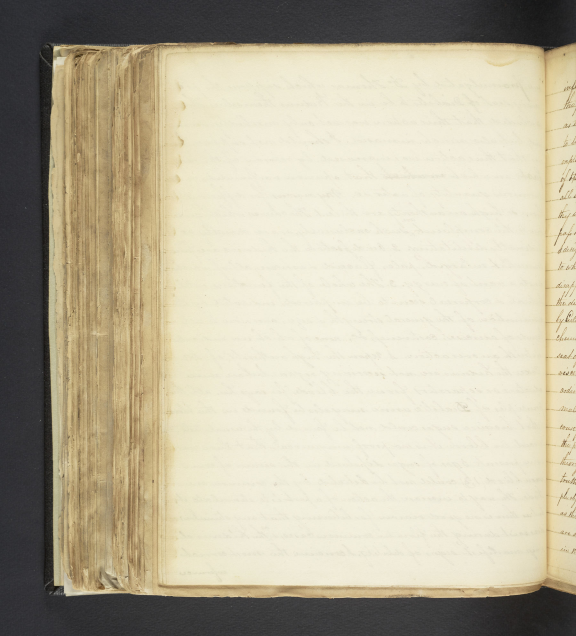
distant from the heart but a very short space; & that the emulgent arteries are supposed to transmit at least one fifth or sixth of the whole volume of blood, we must think 20 minutes a sufficient length of time to exhibit the phenomenon in question. It has also been asserted that any fluid found in the bladder when the ligatures were tied round the ureters, was positively not urine, but a simple exhalation from the extremities of the Cystic artery. Hence Dr. Coxe was led to doubt not only the doctrine of a short route to the bladder, but also the retrograde motion of the absorbents. It is also stated that the absorbents of the surface is the source of the enormous quantity of fluid which is at times evacuated in this complaint. On this subject much contrariety of opinion has existed. Some have denied any power of absorption at all to the skin, while others with equal confidence have considered it competent to the absorption of any matter applied to it in a state of sufficiently minute division. The general conclusion however, at the present day, on all sides, is that the power of absorption, if possessed by the skin at all, is much limited & confined to a very inconsiderable proportion of its extent. It is possible that the emaciation of the body might of itself be sufficient to account for the phenomenon, though the general diminution of heat & action in the system may afford grounds in some measure for the belief of cuticular absorption. This point, however, does not by any means seem to be well settled, so that I shall let that matter rest where I found it. The next & last theory which I shall notice is the

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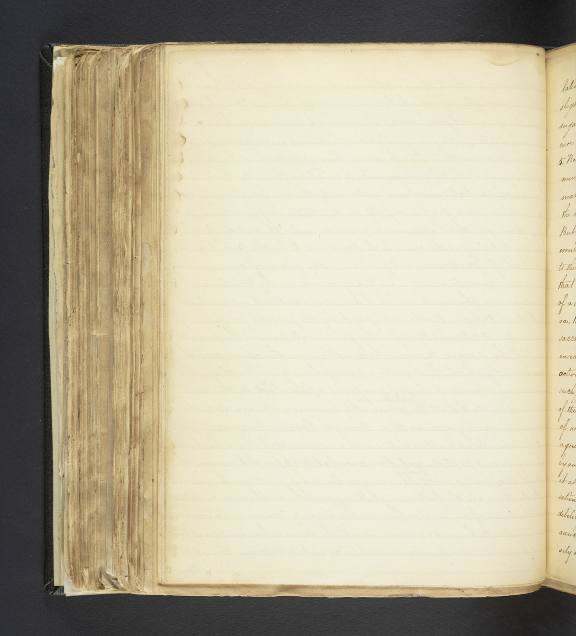


one promulgated by Dr. Thomas which supposes the primary seat of Diabetes to be in the Kidnies themselves. He concluded that their action was not only morbidly deranged, but also much increased. I should not suppose, however that their action was increased, by reason of the very fact on which ~~on which~~ that opinion was founded, viz. the enormous quantity of water &c. My reasons for differing from so high an authority are these. 1. The causes which give rise to the complaint, are such exclusively, as are directly or indirectly debilitating. 2. On dissection the kidnies are found somewhat enlarged, pale, flaccid & varicose, all of which denote a want of energy. 3. The whole of the functions, intellectual & corporeal seem to be impaired, indicated by the diminution of the general strength & size, aversion to all kinds of exercise, costiveness &c, none of which ever indicate in truth an over action. 4 Upon the high authority of Dr. Coxe, the kidnies are not secerning organs, but are mere eductors or separators from the blood, for says he, all the principles of Diabetic urine may also be found in the blood, & that because sugar could not be found by the usual tests to exist in blood, it is no proof (unequivocal) that there was none present. 5 grs. of sugar dissolved in the serum of common blood (1 ℥) could not be detected by the common methods. The way to increase the action of a part is to stimulate it, but as there is no good reason for believing that any stimulus does exist during the flow in common cases, & as the kidnies always manifest signs of debility, I conceive the most correct

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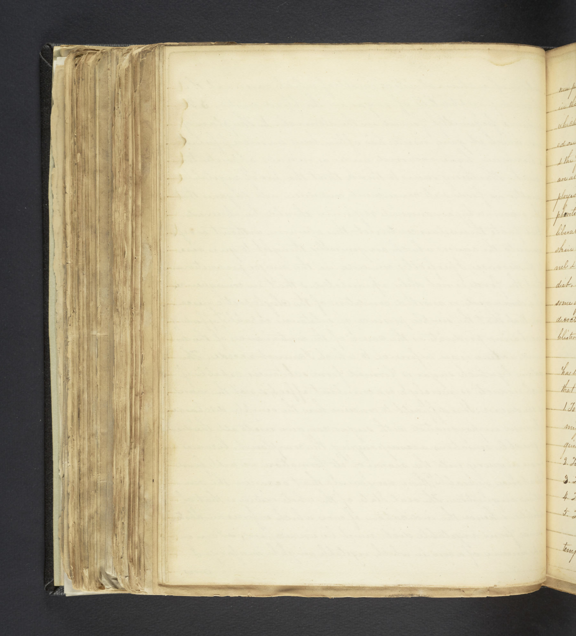


inference is that this action is diminished. As then all the principles of diabetic urine exist also in the blood, & as the quantity of water is so much increased, how is it to be explained? is a question which at once presents. The explanation is this. The kidnies being deprived by debility of the power which is requisite to enable them to keep back all such particles as do not enter into the composition of healthy urine, must of necessity in this case suffer others to pass through that otherwise would not. The last theory which I design noticing is the one which I conceive to be the true one, & to which, if attention is not paid in the plan of cure, many disappointments must inevitably ensue in the treatment of the disease. The one to which I allude, was that advocated by Cullen, Dobson, Rollo &, in part, by the present professor of Chemistry (Dr. Coxe.) It refers the proximate cause, the primary seat of the disease to a morbid action in the chylopoetic viscera, by which the digestive process being obstructed, the ordinary aliment is not properly assimilated to the animal fluids, & that the affections of the skin, the kidnies &c, are secondary consequences by sympathy. Though I cannot accede to all the propositions embraced in the arguments by which the theory is supported, yet I conceive it to approach nearer the truth than any with which I have yet been aquainted. The principle objections are the following, 1. It supposes the saccharine matter as the basis of an indication in the cure. 2. Many instances are stated to have occurred in which the saccharine matter in the urine was so inconsiderable as not to deserve the appellation



lation of a characteristic; in all of which cases not the slightest perceptibility of sugar in the blood existed. 3. No sugar is frequently found in the stomach. 4. The plan of cure which it gave rise to, has often been unsuccessful. And 5. Recoveries have occurred under a precisely opposite treatment. This theory seems to think that the use of vegetable matter as food & its consequent conversion into sugar, is the the reason why an animal regimen should be observed. But facts themselves controvert this opinion, without a reference to the causes which are generally thought to give rise to the disease. I perfectly coincide in the major proposition that the food is not duly assimilated, & that in consequence of a deranged, or morbid condition of the chylopoetic viscera. But that the simple presence of substances capable of affording saccharine products is the cause of the continuance of the diseased action is an inference to which I cannot accede. The action by which sugar is formed from substances capable of such products, is merely a concomitant effect, & not the cause of the disease. It is difficult to conceive how the simple discharge of urine impregnated with sugar, can give rise to all the disagreeable sensations accompanying the complaint, because by an inquiry into the reason of its formation, we will find it at once referable to those very causes that occasion the sensations in question. The real state of the whole system is that of debility, & hence the indication of cure which enforces an abstinence from vegetable diet, must be unnecessary, & I can easily conceive of a case in which vegetable might be necessary. I

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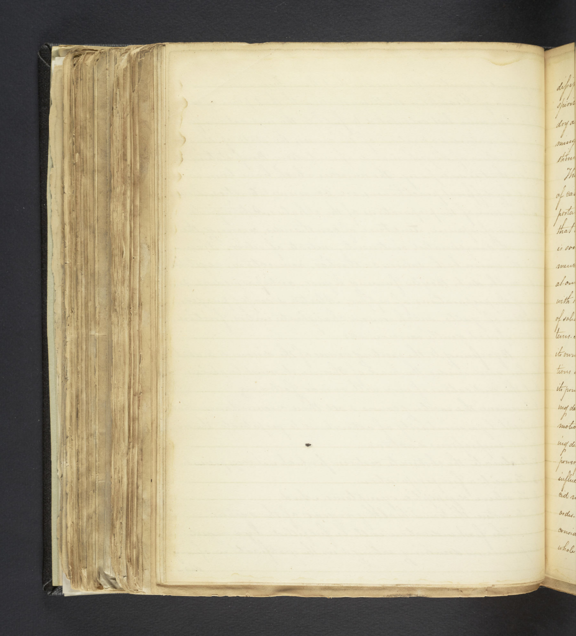


now proceed to mention the remedies that have been recommended in the cure of Diabetes, & shall conclude with that plan of cure which I conceive best calculated to fulfil the indications, founded on the nature & operation of the causes, the state of the system & the function of digestion and assimilation. Brief statements are all that is necessary. The remedies which have been employed by different practitioners, are occasional Emetics, Diaphoretics, some of the preparations of the alkalies, Astringents, liberal use of opium, tincture of cantharides, covering the skin with camphorated ointments, nitrate of silver. Flannel & the warm bath, saline cathartics, venesection, vegetable diet, milk diet, Boyles fuming liquor, antispasmodics, & some of the preparations of copper, Aloetic & soapy purges, decoction of galls, sulphurous & chalybeate waters, frictions, blisters, issues & gentle exercise. &c.

By refering to the exciting causes of the disease, & to what has been said under the head of Theories, it must be obvious that the indications of cure will run as follow, viz:

1. To remove the exciting causes, & all those circumstances that might by a similarity of action tend to perpetuate the original impressions & actions.
2. To obviate the obstinate costiveness which is always present.
3. To excite a free perspiration.
4. To relieve dyspeptic symptoms. And,
5. To restore the tone & healthy vigour of the system.

The first indication will be fulfilled by a rigid temperance in drinking, eating & in the gratification of any dis-



dissipating propensities, a strict abstinence from ardent spirits, hot stimulating teas &c; by a continuance in warm dry air (if in the winter); by a warm, uniform apparel; by mingling with lively, jocular company; & by a well seasoned stimulant regimen.

The second indication is readily fulfilled by a course of cathartic medicines, & is by all means one of the most important objects in the treatment of the complaint. It seems that in every complex apparatus designed for motion, there is some centre or fulcrum from which its motions are to commence their operations. Remove or derange this fulcrum & you at once affect the whole apparatus. Such is precisely the case with the animal body. It is a great complex machine, a union of solids & fluids, an assemblage of organs, a system of systems. And though each organ, or minor system be endowed with its own peculiarity of structure, & is destined to perform its functions independently of any one of the rest exclusively, yet its power & energy for such performance, by its attachments, being derived from them either individually or collectively, its motions must cease or become deranged at every corresponding derangement in them. That organ then which has the most powerful, extensive & necessary connection ~~connection~~ with, & influence over the rest, is certainly the one, to which, in a decid majority of cases, we are to look, for the cause of their disorders. The chylopoetic viscera may with much propriety be considered as constituting this centre of power & energy to the whole system. And there is no instance more strikingly illustrative

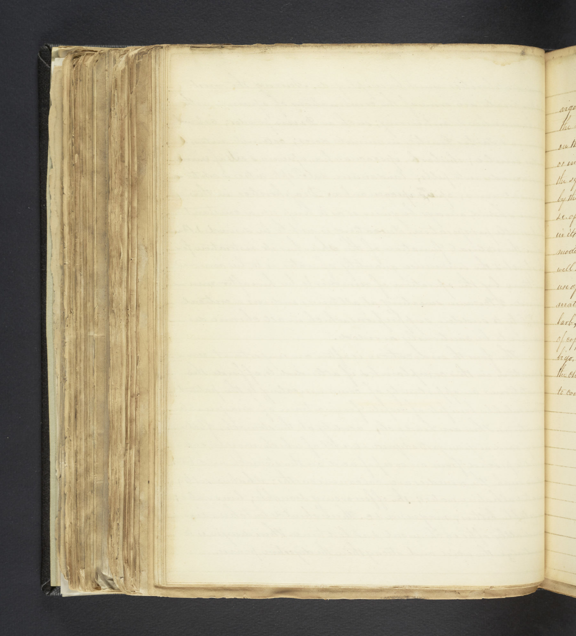
tive of the above remarks than Diabetes. And it is only by restoring the healthy action of the alimentary tube that the disease will be likely to prove any way manageable. Costiveness proceeds itself from a disease of the intestinal. The bowels become ^(caused) overloaded by intemperance in eating, or by the introduction of such matter as is not easily digested, or their function is deranged & morbidly excited by powerful impressions, their energy is impaired, they are unable to expel the excrementitious portion, it becomes impacted, & of course, parts depending on them for support must suffer. Cathartics become necessary to assist nature in the extrication of herself from difficulties. Among the most appropriate I consider calomel & Rheubarb in combination; calomel & jalap; jalap & cream of tartar; aloes & myrrh. cream of tartar & sulphur. These if properly administered, which is accomplished by first exciting a drastic effect by large doses, & then ^to preserve the bowels from constipation by small & often repeated doses of any of the above prescriptions.

The third indication is founded ^on the physiological fact, that the surface of the body is in intimate sympathy with parts deep seated, & that discharges from one frequently alternate with the other, & also on the fact that the skin is always dry & harsh in this disease, which is highly indicative of a destruction of function in the extreme vessels. To answer this indication our object finally is to cause a reversion of fluids in favour of the kidneys which seem to be overcharged, & to this

end

and diaphoretics must be employed. Among the most appropriate are some of the combinations of opium, with ipecacuanha & antimony; such as Dovers powder; calomel opium & Tartar Emetic in minute doses; calomel, nitre & tartar emetic; rhubarb, ipecacuanha, opium & oil of cinnamon, made into pills; laudanum, dulc. spt. nitre & antimonial wine; opium & ipecacuanha. Diaphoretics in this disease should always be given so as to keep up a constant but gentle perspiration. Sweating is not to be desired 1. Because the natural function of the skin, has its restoration for the object & the immense quantity of water is to be removed in time by the operation of remedies to be hereafter mentioned. 2. Because sweating at all times induces a critical liability to sudden suppressions which in all chronic diseases are to be cautiously avoided.

The fourth indication is often an important consideration in this complaint & if attended to, affords the practitioner an opportunity of communicating to the patient incalculable benefits of respite from a train of disagreeable sensations. These are headach, acidity at the stomach, flatulency, cardialgia, gastrodynia &c. All of which may be supposed to proceed from an excess of acid on the stomach and treated as such. The remedies are, calcareous earths; alkaline salts; aerated alkaline water; the effervescing draught; lime water; vegetable bitters; magnesia &c. These should be taken immediately after each meal, & at bed time. Their design is to neutralize the acid and strengthen the digestive powers.



The fourth indication is to restore the tone & healthy vigour of the system & though simple certainly constitutes the basis of the treatment of this disease. It is founded on the belief that the causes of the symptoms are directly or indirectly debilitating, & that the fibres of every part of the system are in a state, more or less, of relaxation, denoted by the appearances on dissection & the motions, sensations, habits &c. of the patient previous to death. The remedies to be employed in its fulfilment are temperance in drinking & eating; moderate exercise; nourishing, stimulating Diet of which well seasoned animal food constitutes the chief; moderate use of wine; Peruvian bark, carbonate of iron & some aromatic in the form of an electuary; carbonate of iron & rhubarb; Sulphate of zinc, valerian & Peruvian bark; sulphate of copper & extract of Bark; filings of iron & honey; Ferri Rubigo, orange peel, gentian root & Bark &c. &c. These constitute the chief tonics in the removal of that debility which seems to constitute the ground work of all the symptoms of Diabetes.

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